LAPORAN PRAKTIKUM
SISTEM OPERASI

Disusun Oleh :

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FAKULTAS KOMUNIKASI DAN INFORMATIKA
UNIVERSITAS MUHAMMADIYAH SURAKARTA
TAHUN AJARAN 2021/2022

Lembar Kerja Modul 2

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Dosen Pengampu	: Heru Setiya Nugraha, S.T., M.Kom.	Tanda Tangan :
Asisten Dosen	: 1. Calvin Alvito	
	2.	
Tanggal Praktikum	: Selasa,s 20 September 2022	

Tugas berada di bawah setelah laporan percobaan modul 2.

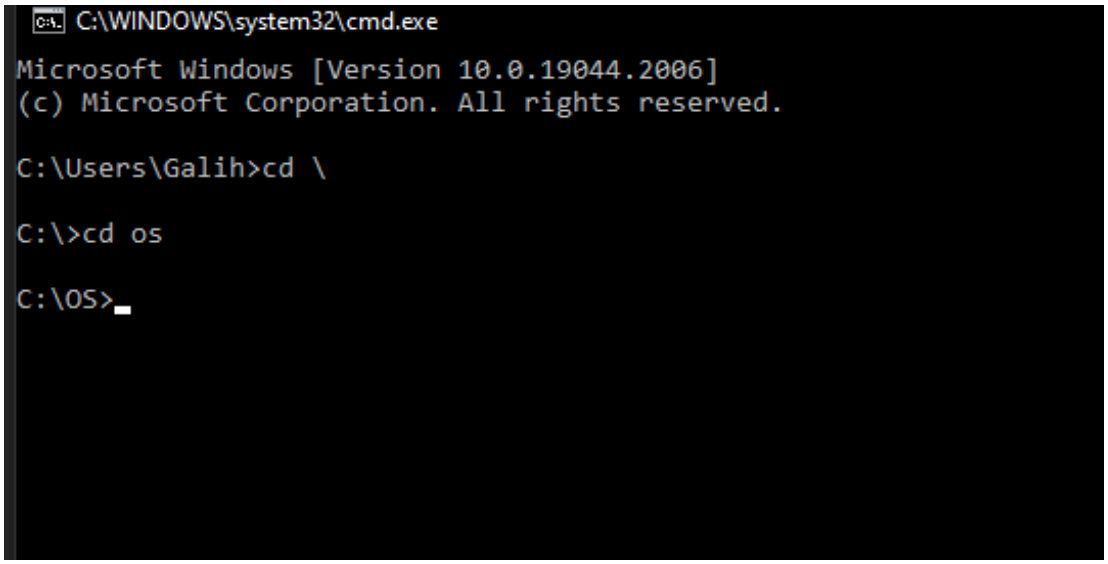
Nama "Galih" pada cmd yaitu nama kakak saya bukan nama mahasiswa lain.

بسم الله الرحمن الرحيم

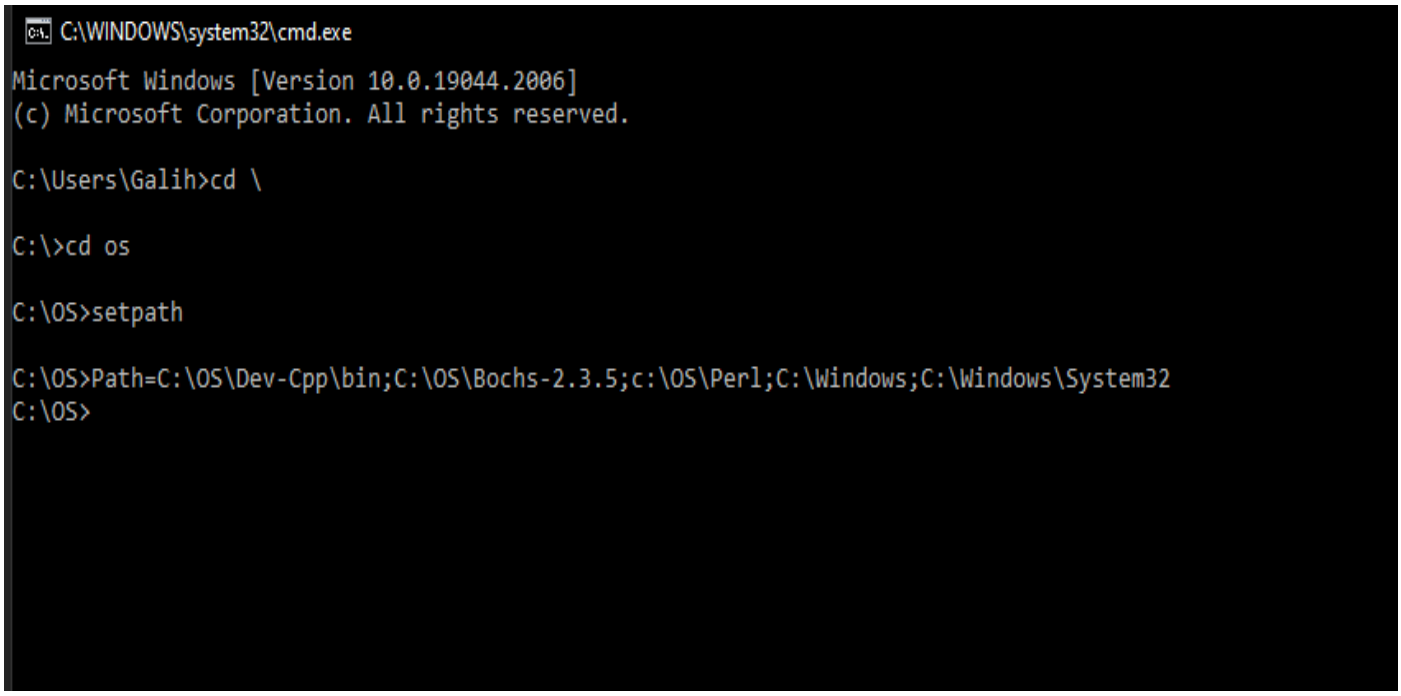
PERCOBAAN MODUL 2

" Membuat Program Bootstrap Loader Sederhana Pada Sebuah Disk "

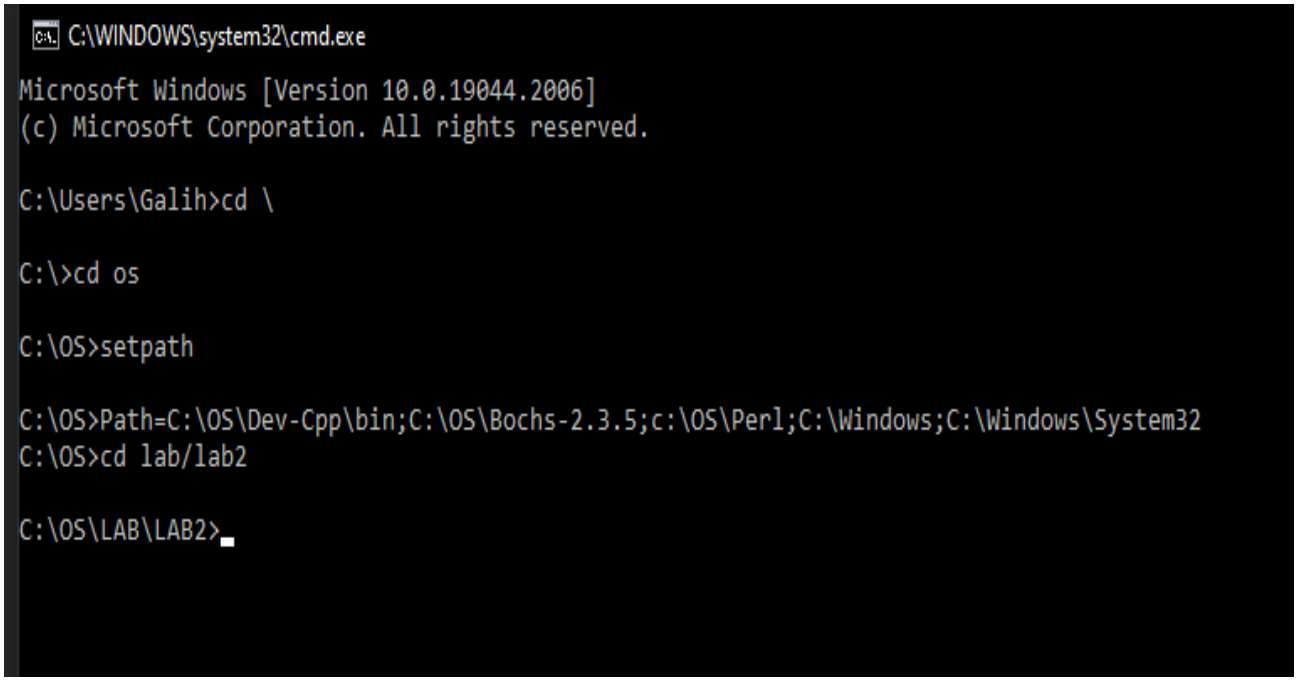
Ketik **" cd \ "** lalu ketik **" cd os "**



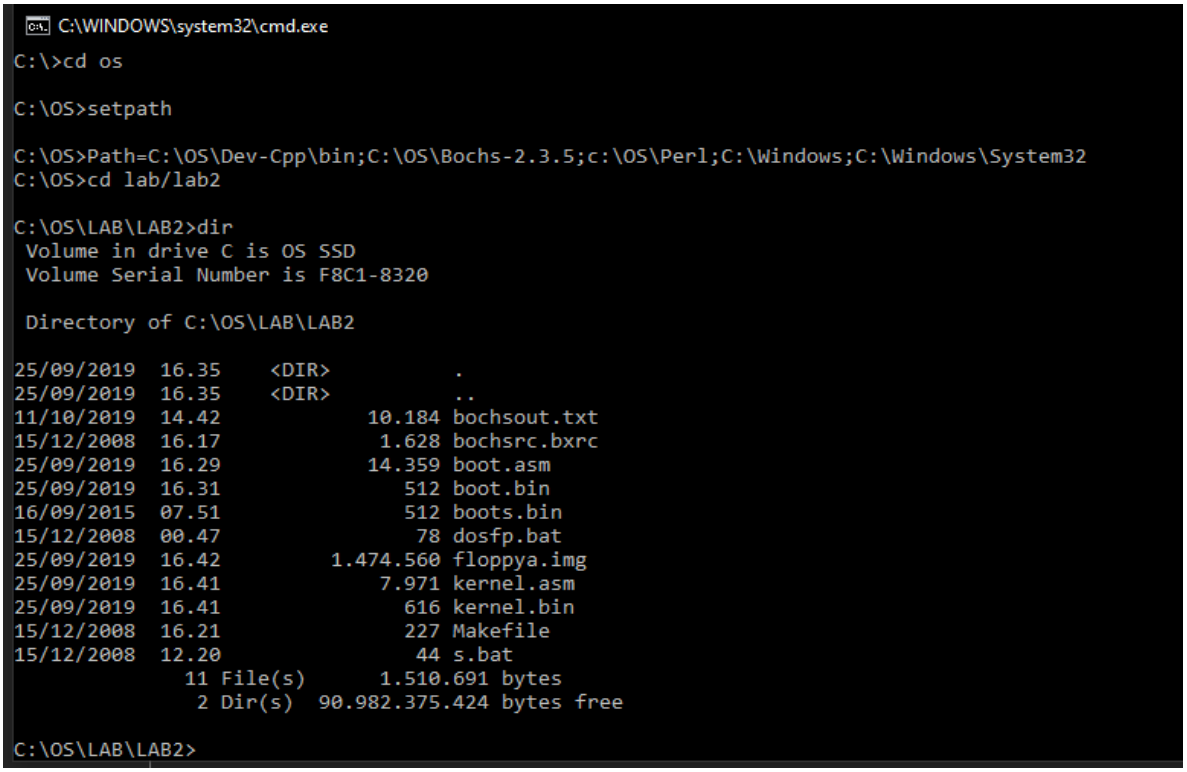
Ketik **“ setpath “**



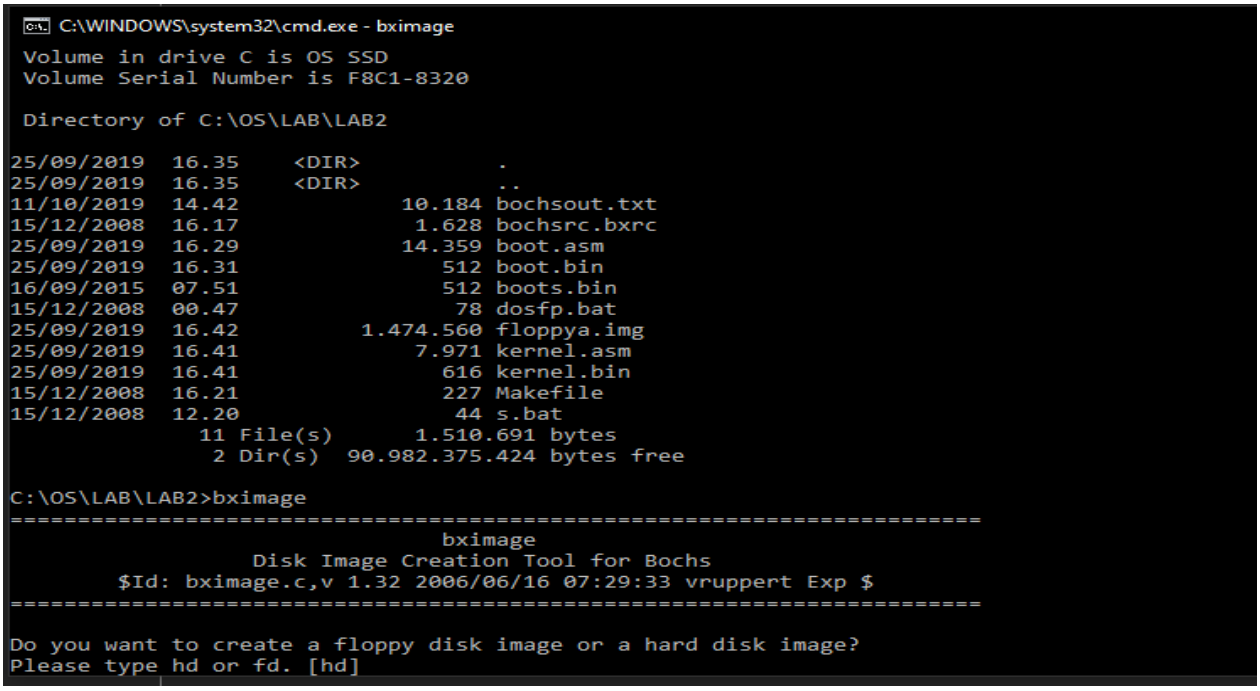
Ketik **“ cd lab/lab2 “**



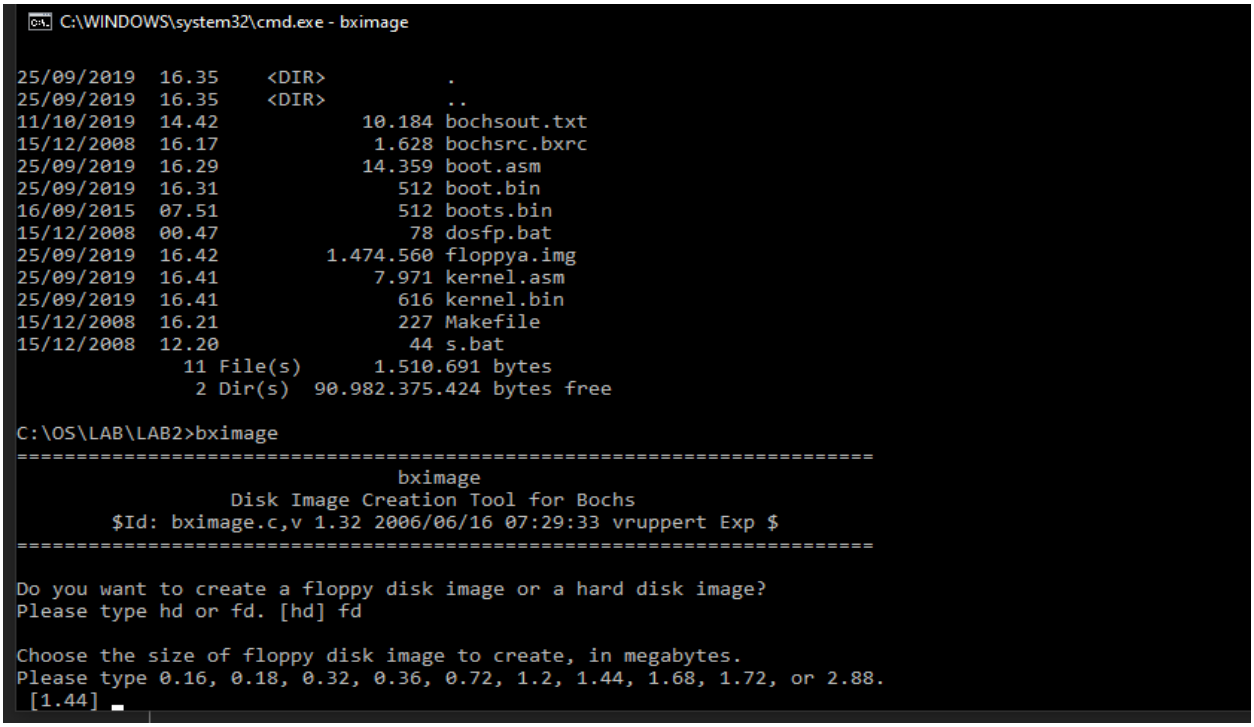
Ketik **“ dir “** untuk melihat isi directory



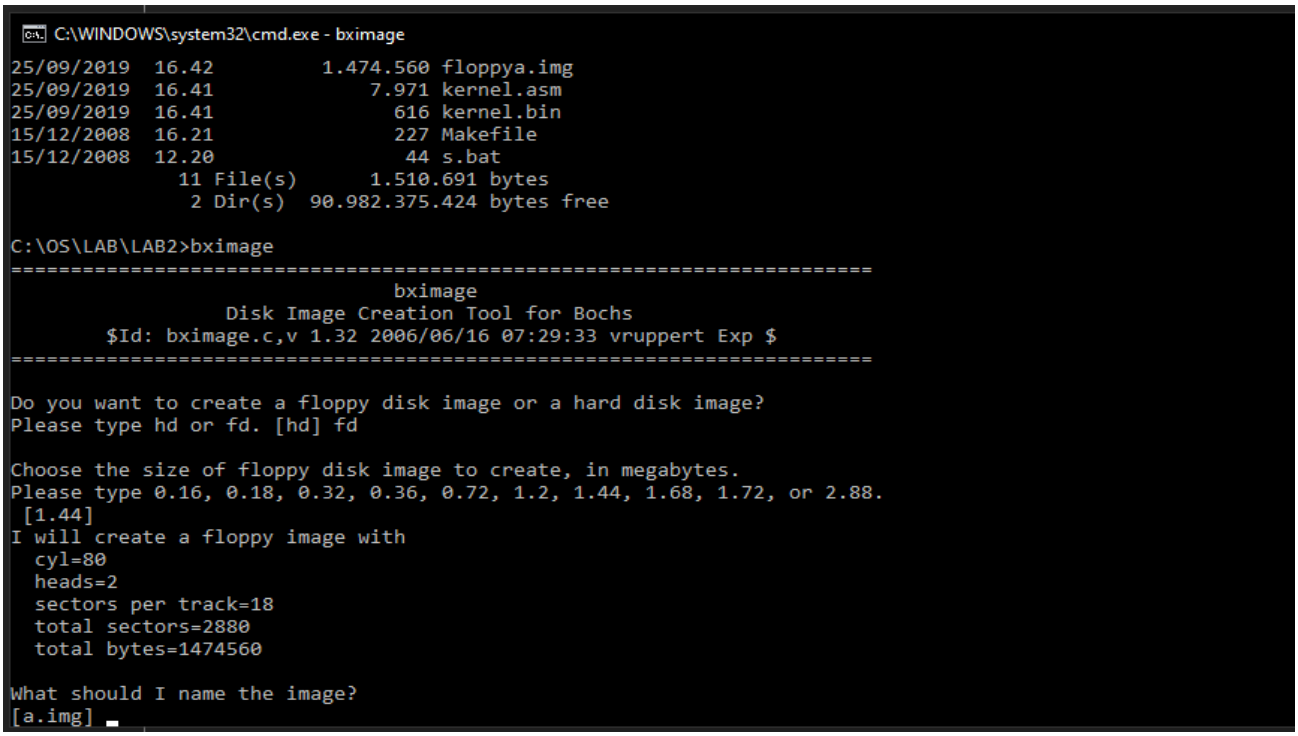
Ketik **“ bximage “**



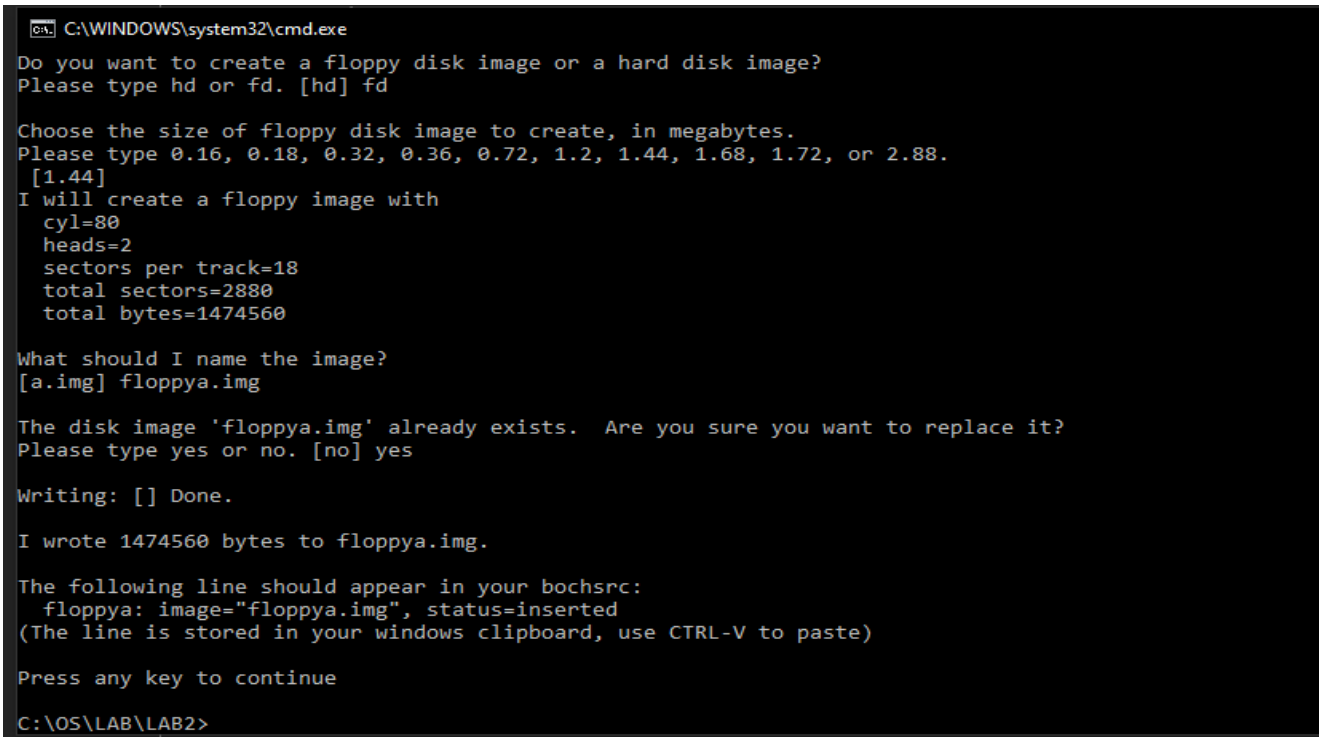
Ketik **“ fd “**



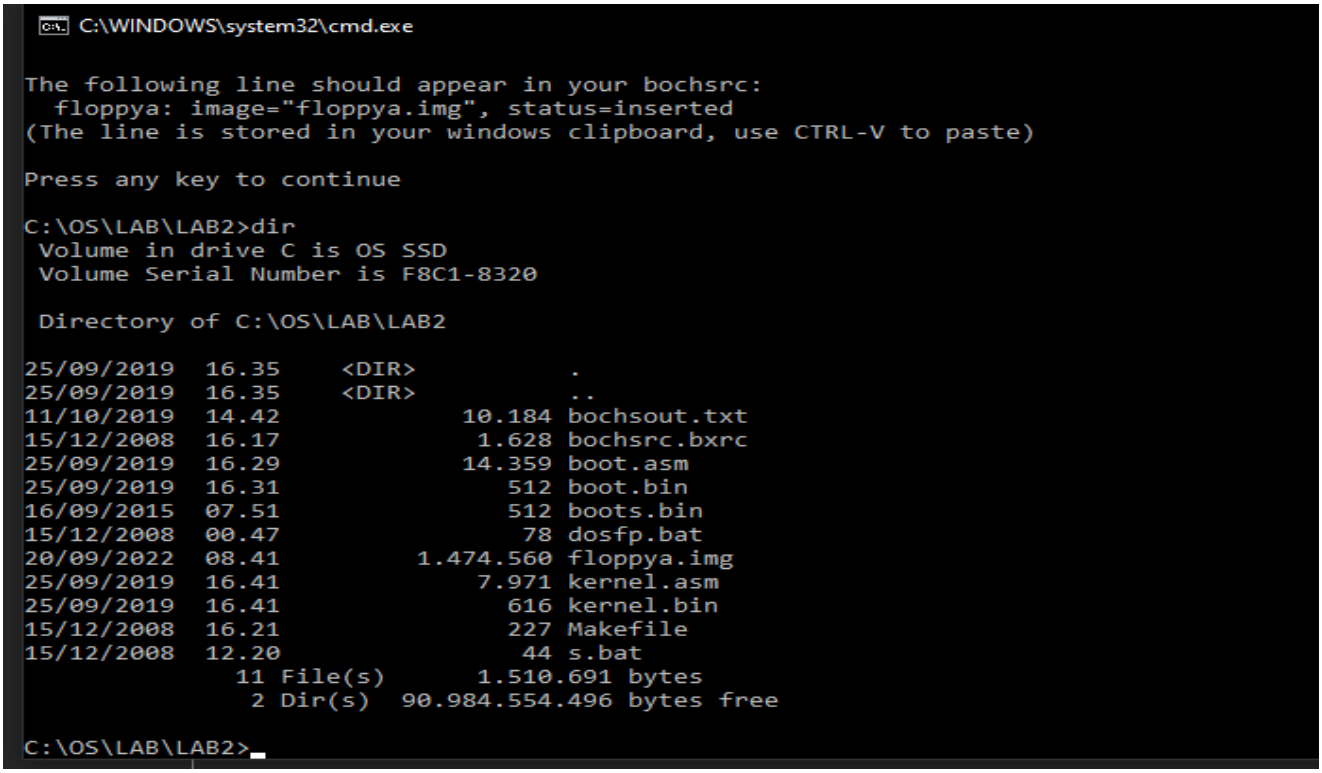
Pilih 1.44 Lalu tekan **<ENTER>**



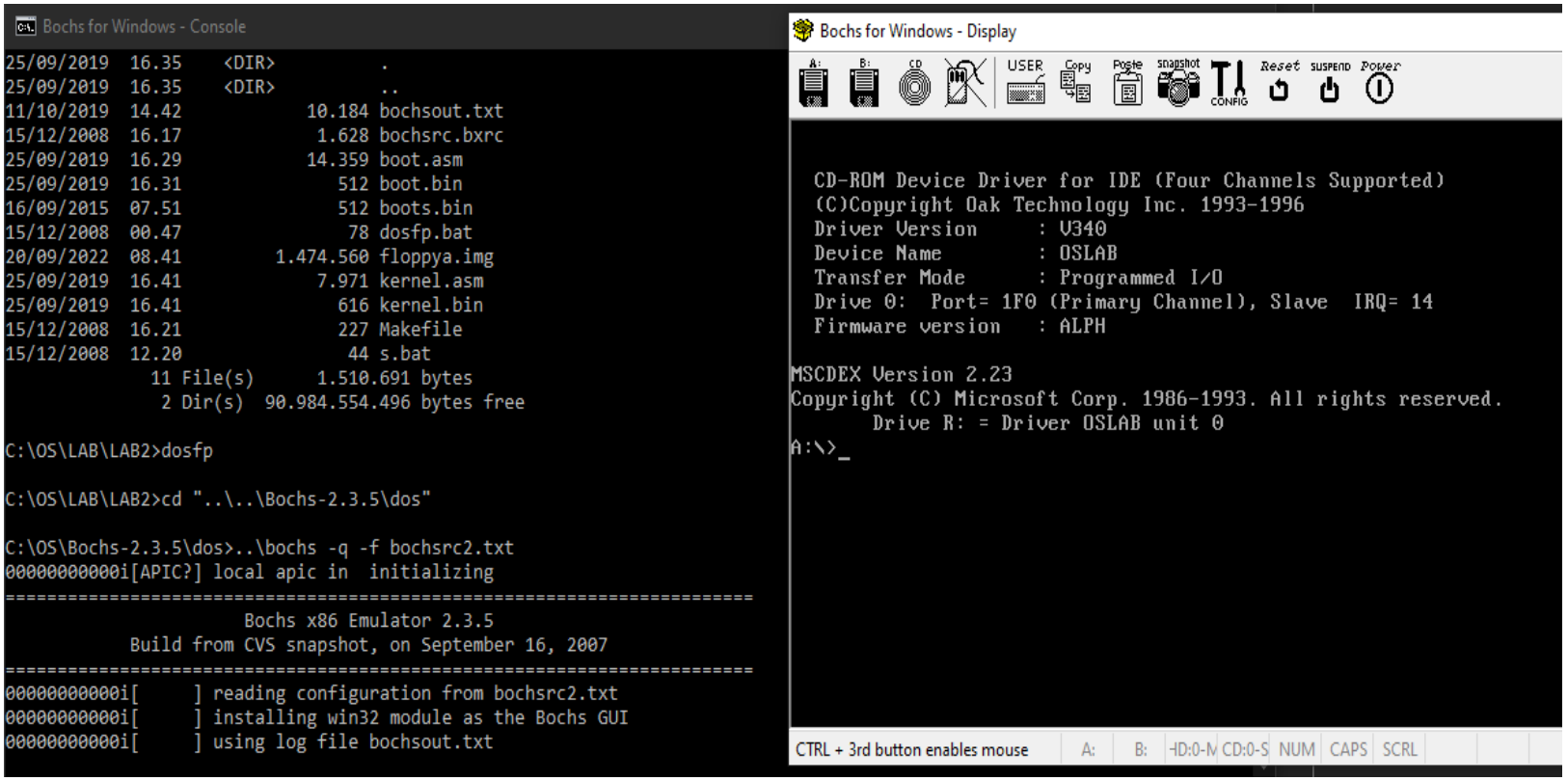
Ketik **floppya.img** . Karena ternyata saya sudah terdapat file floppya.img maka saya replace dengan mengetik **yes** dan **<ENTER> 2X**.



Ketik **“ dir “** untuk mengecek isi directorynya

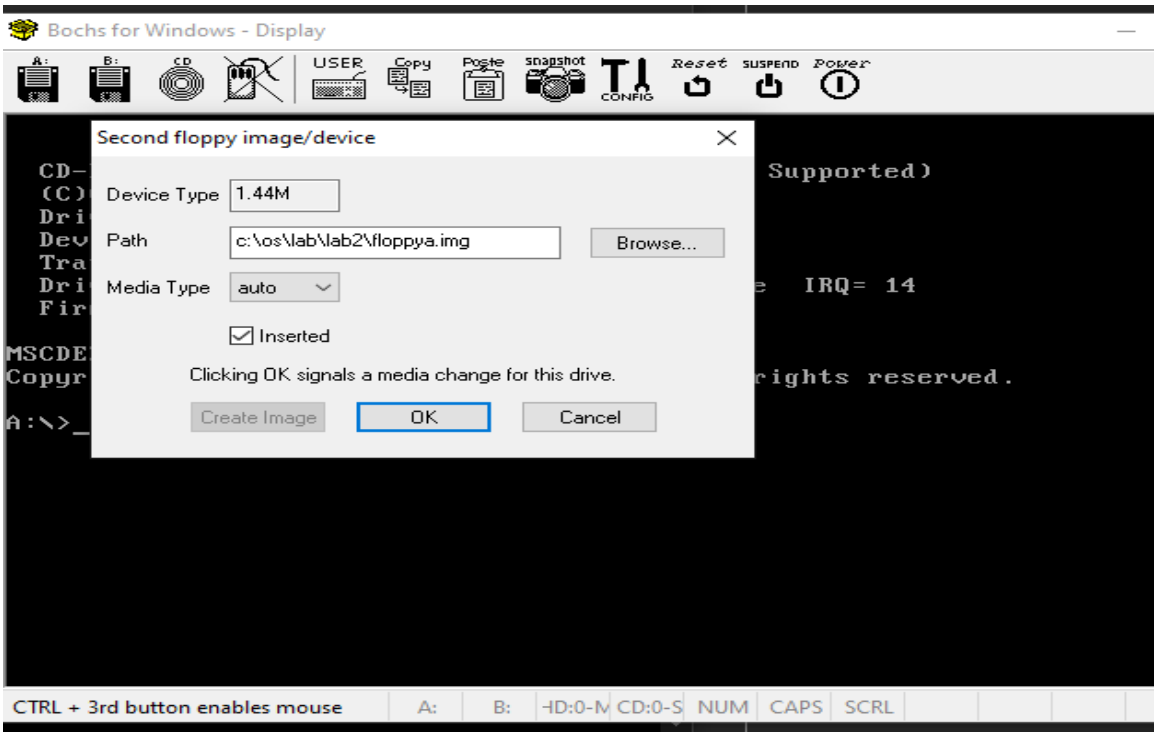


Ketik **“ dosfp “** untuk pindah ke ”Bochs Windows”

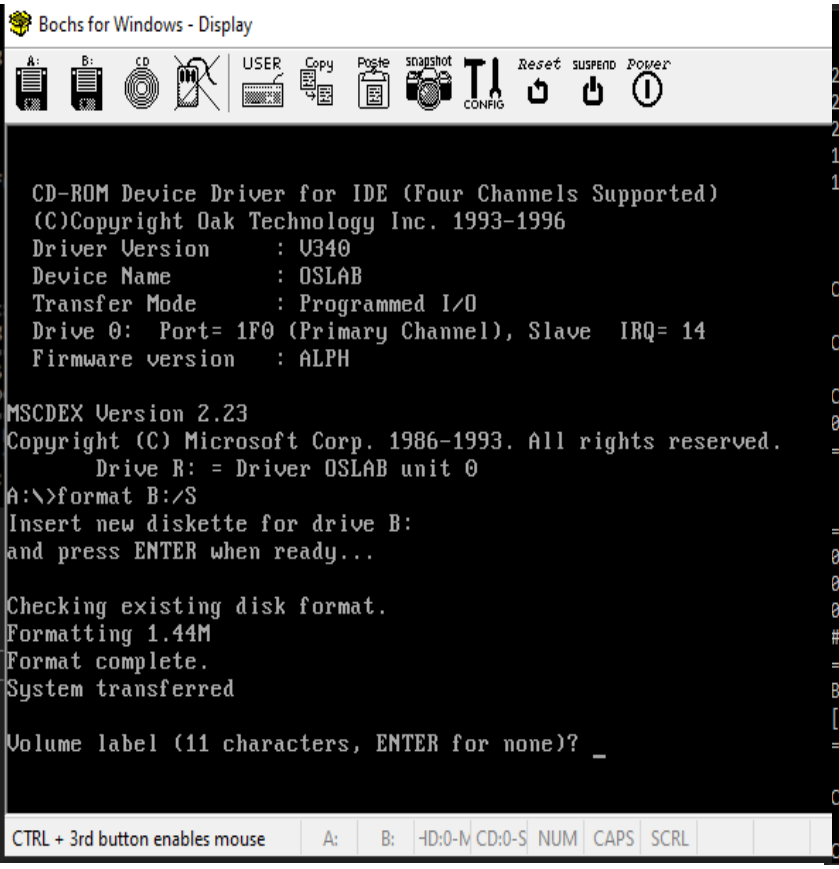


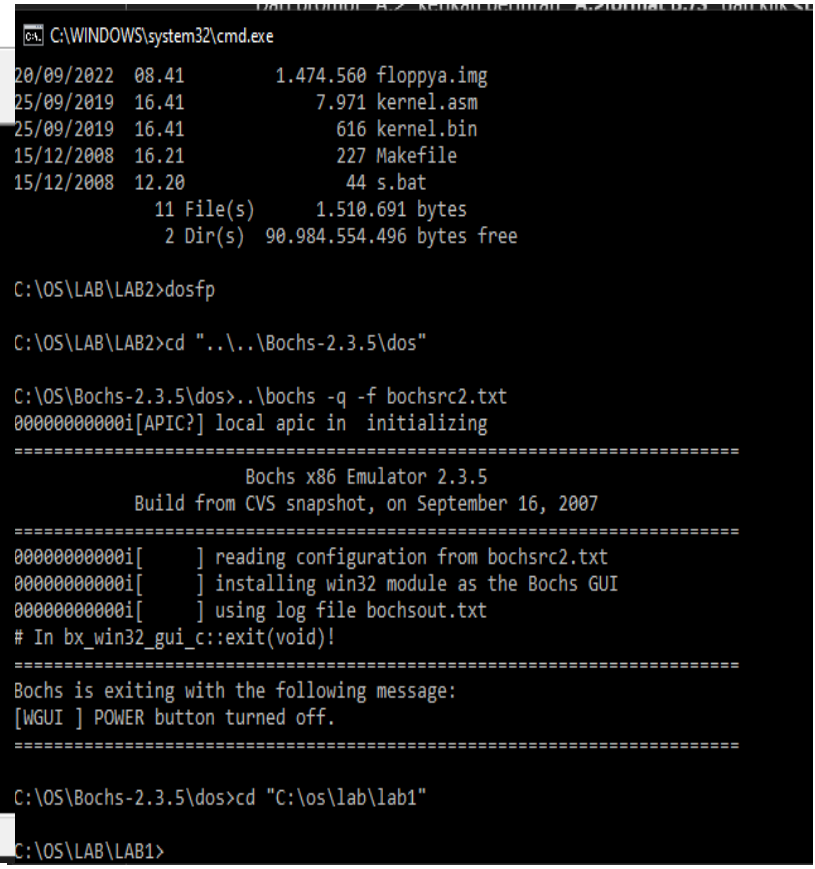
Klik menu gambar floppya disk nomor dua dari kanan

Atur lokasi file image sehingga menunjuk ke file “floppya.img” yang terdapat pada direktori kerja “lab2” dan atur sehingga location berada di **“C:\OS\Lab\Lab2\floppya.img ”** lalu klik **“Ok”**

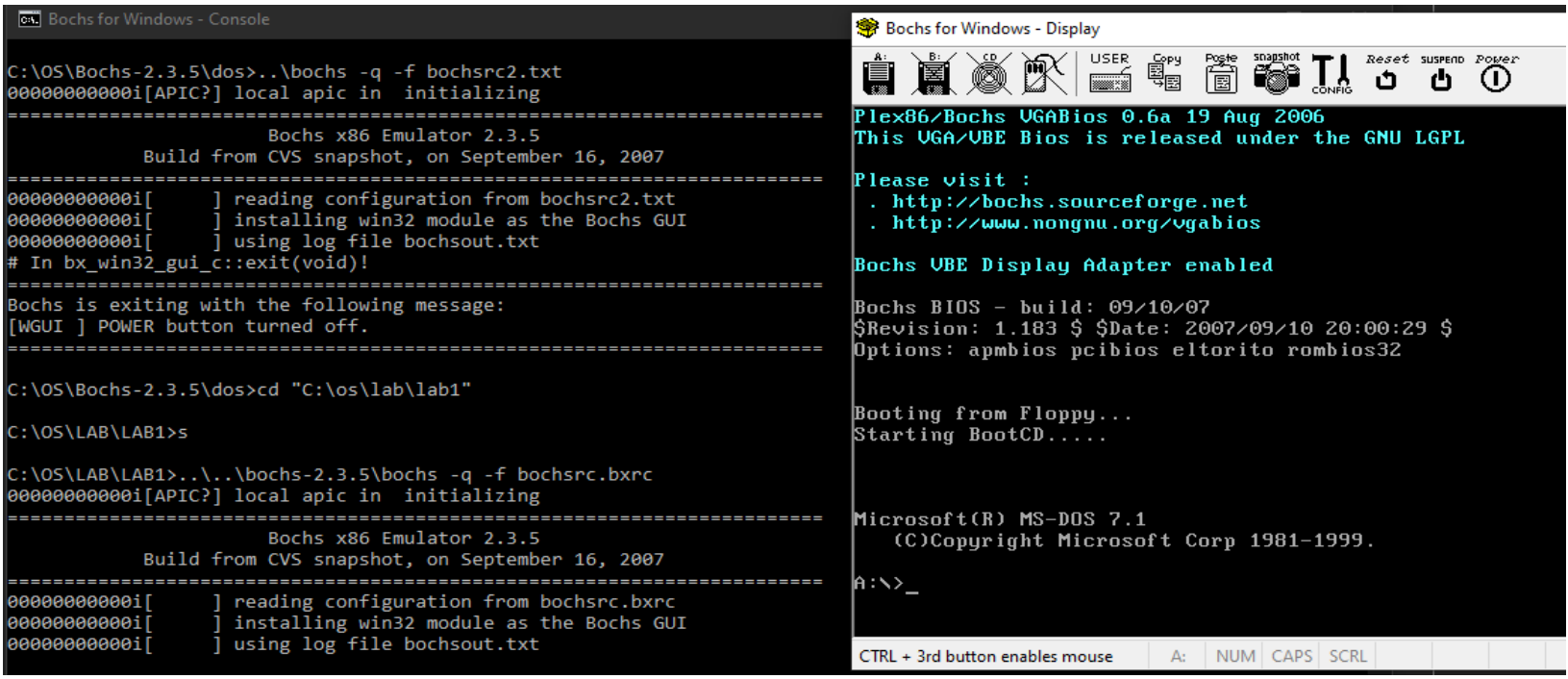


Dari prompt "A:>" ketikan perintah **" A:>format B:/S "** dan klik **<ENTER> 2X.** Lalu Klik **"Power Off"**



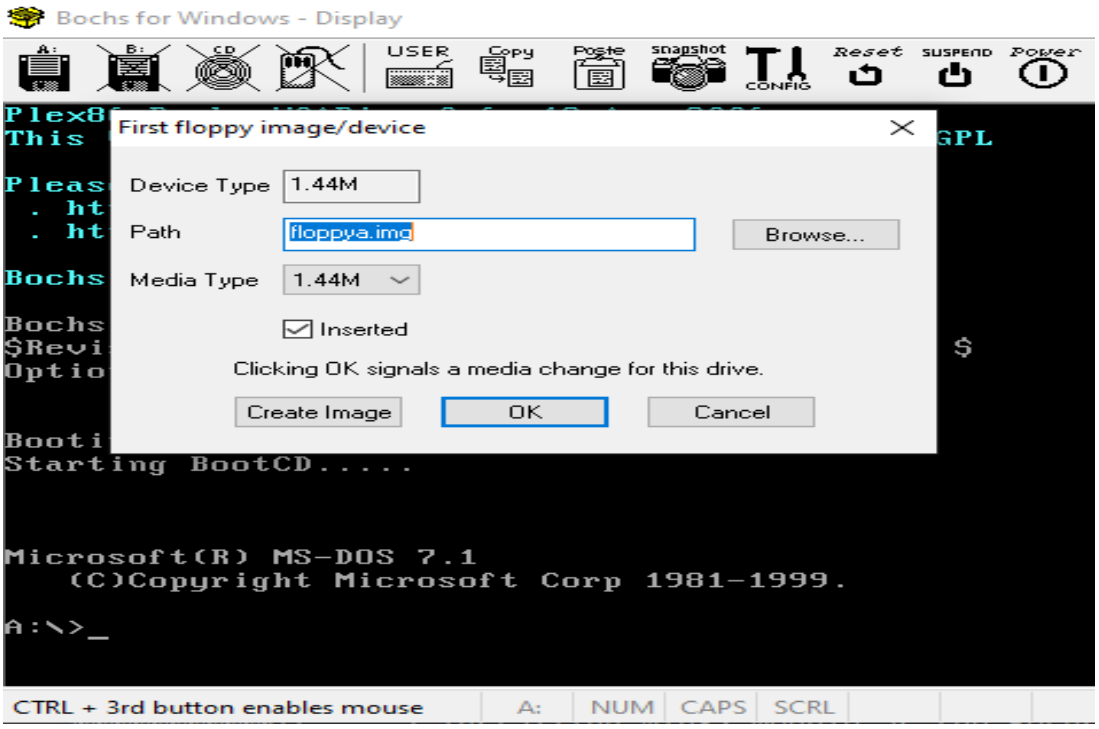


Boot PC-simulator dengan file “floppya.img”. Pindah ke direktori kerja pada window “Command Prompt” dan ketikkan **“ s ”** lalu **<ENTER>**. PC-Simulator akan melakukan proses boot dengan disk boot yang berasal dari file “floppya.img” yang diletakkan di “drive A:”.

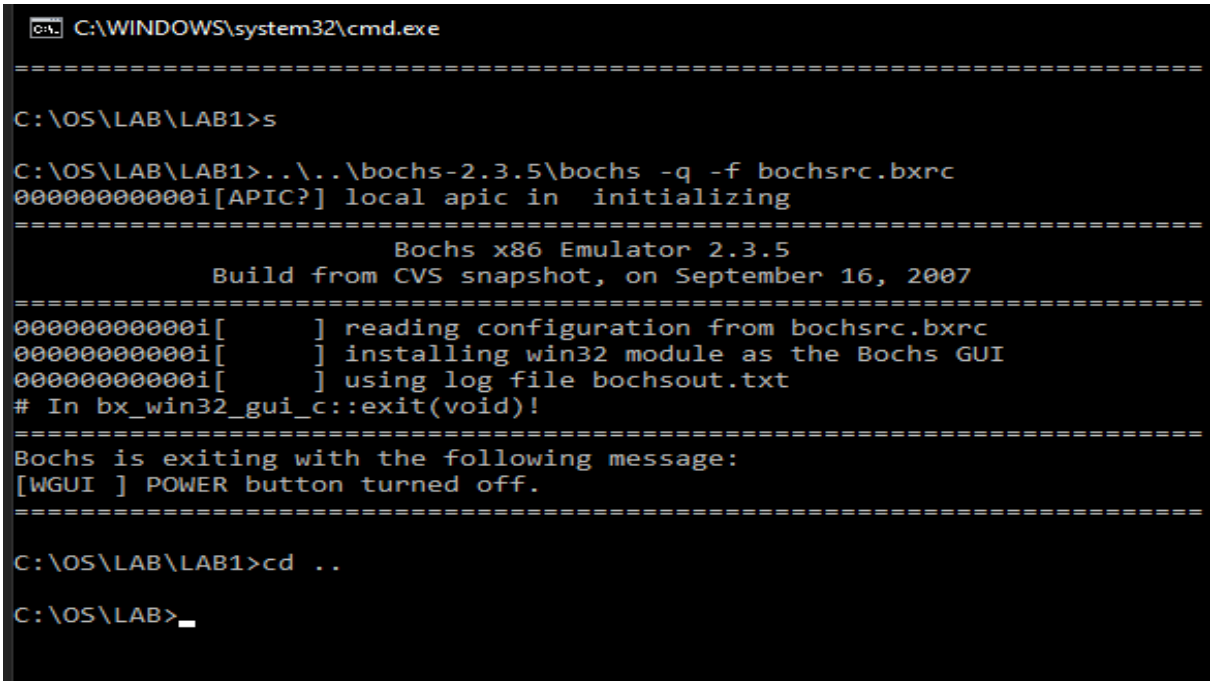


Lalu **“ klik tombol gambar paling kiri “.**

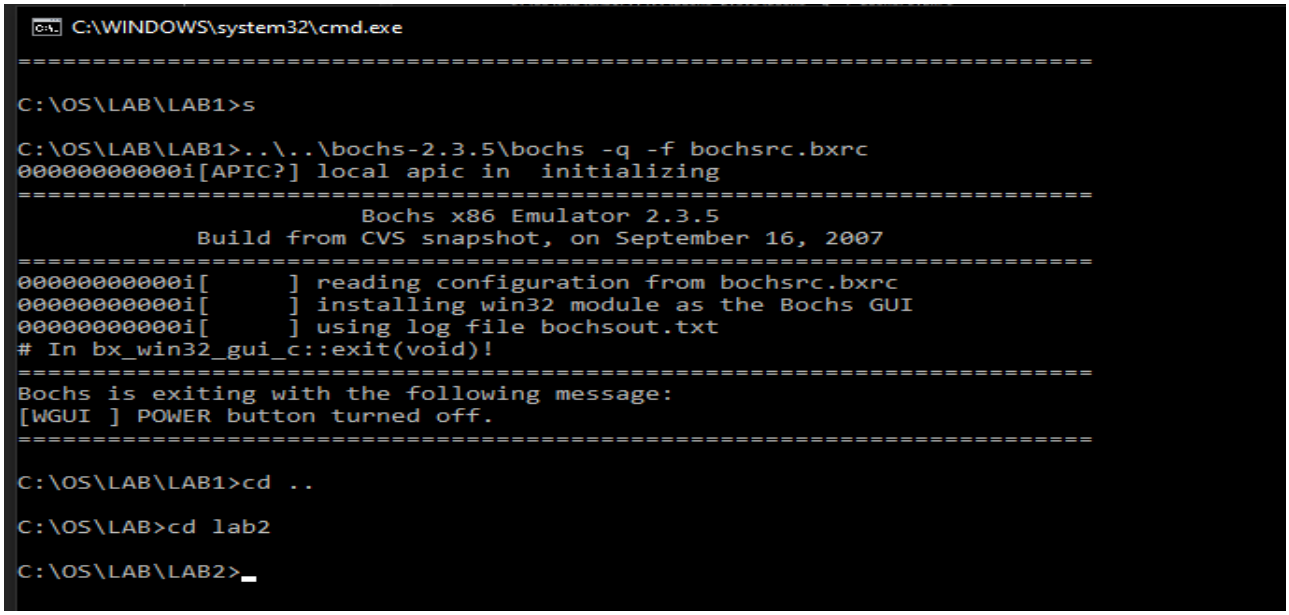
Lalu pastikan location berada di *floppya.img*. Jika sudah sesuai, tutup kembali PC-Simulator, klik tombol **“ Power ”**



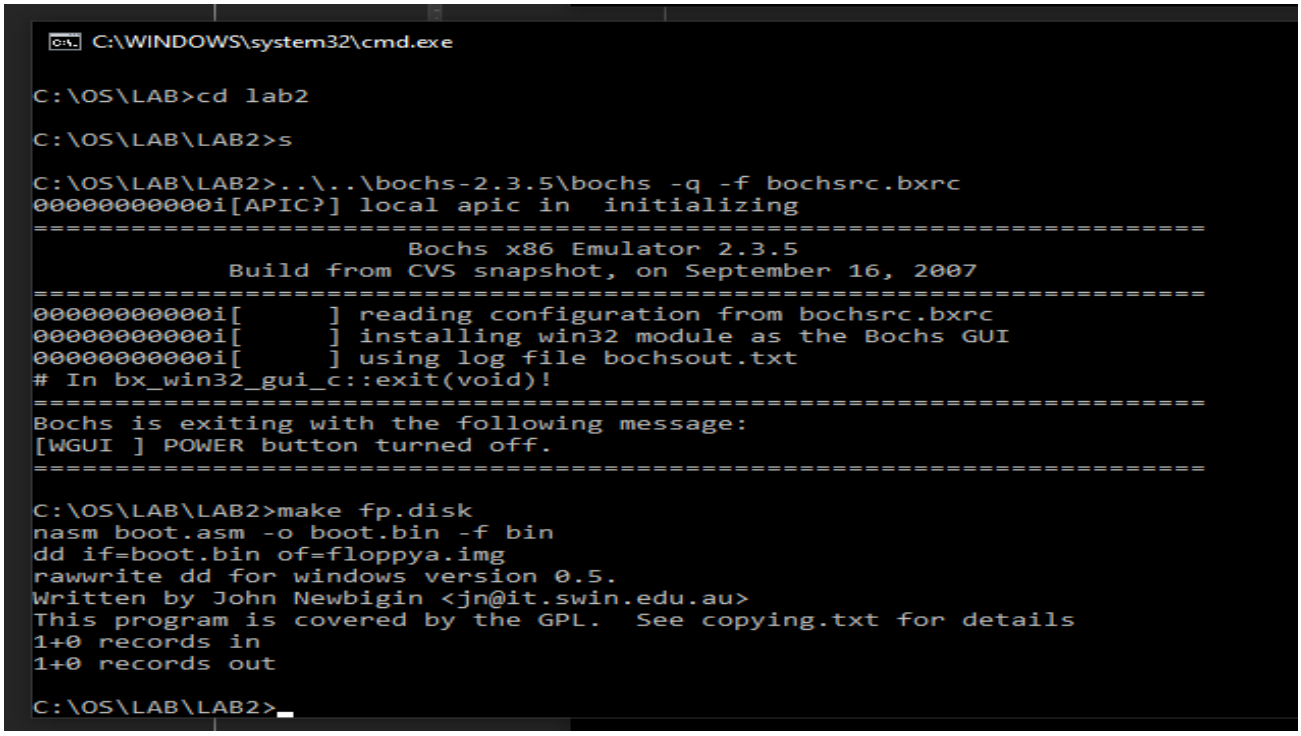
Karena saya berada di *C:\Lab\Lab1* maka saya pindahkan menjadi ke *C:\Lab\Lab2* dengan cara ketik **“ cd .. “**



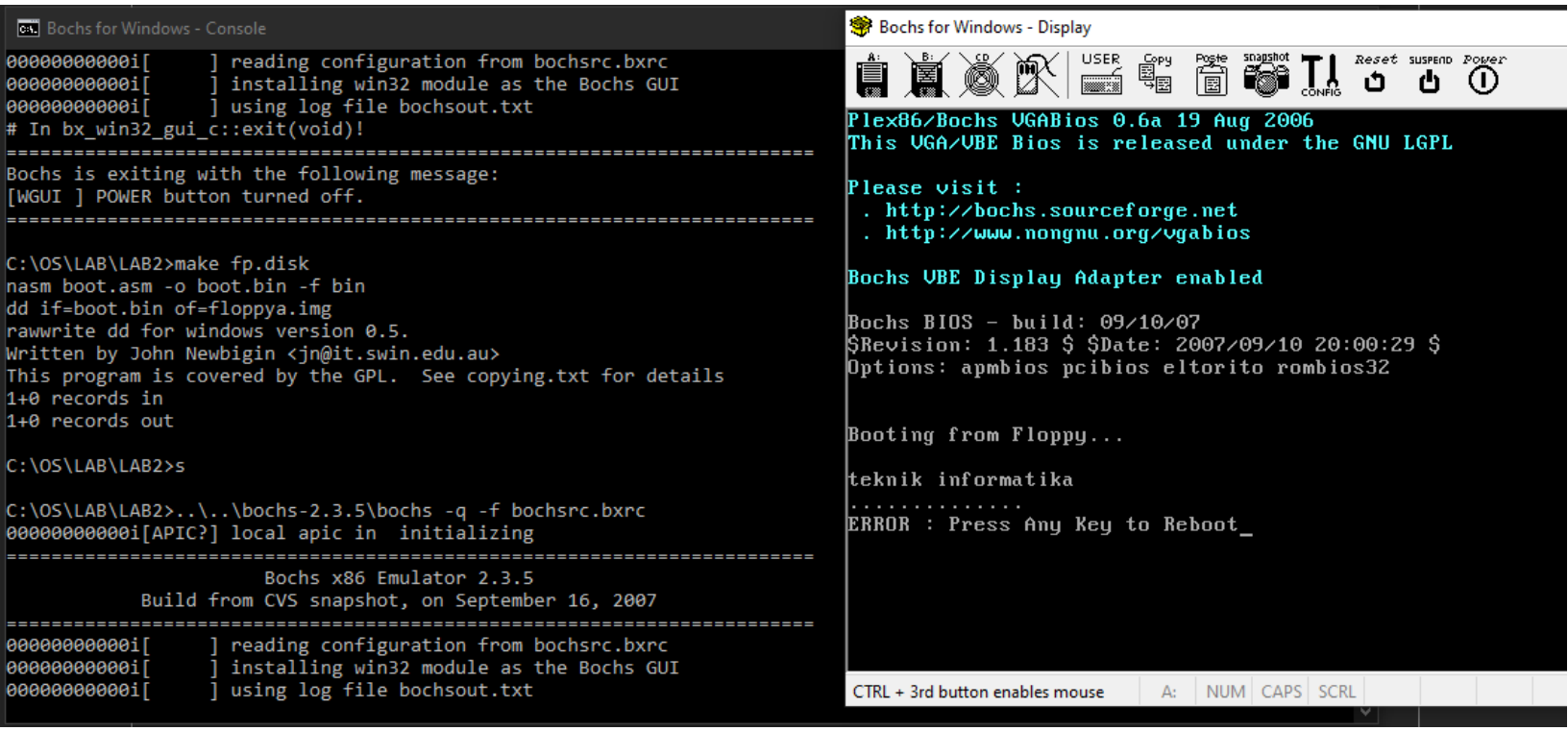
Lalu menuju ke lab 2 dengan ketik **“cd lab2”.**



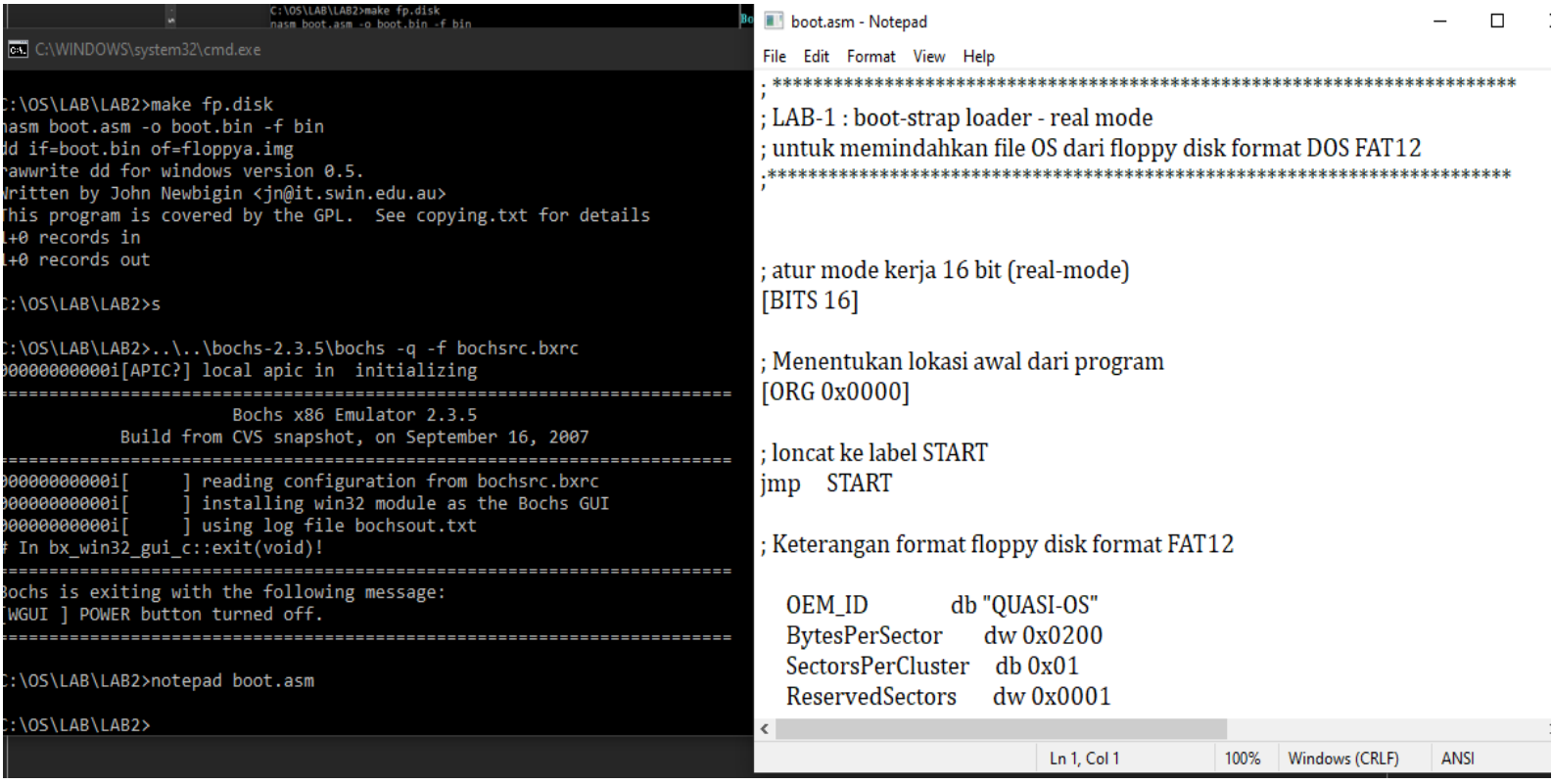
Lalu ketikan **“ make fp.disk ”** dan **<ENTER>.**



Lalu ketikan **“ s ”**



Untuk menyunting file “boot.asm”, ketikan **“ notepad boot.asm “** dan **<ENTER>**

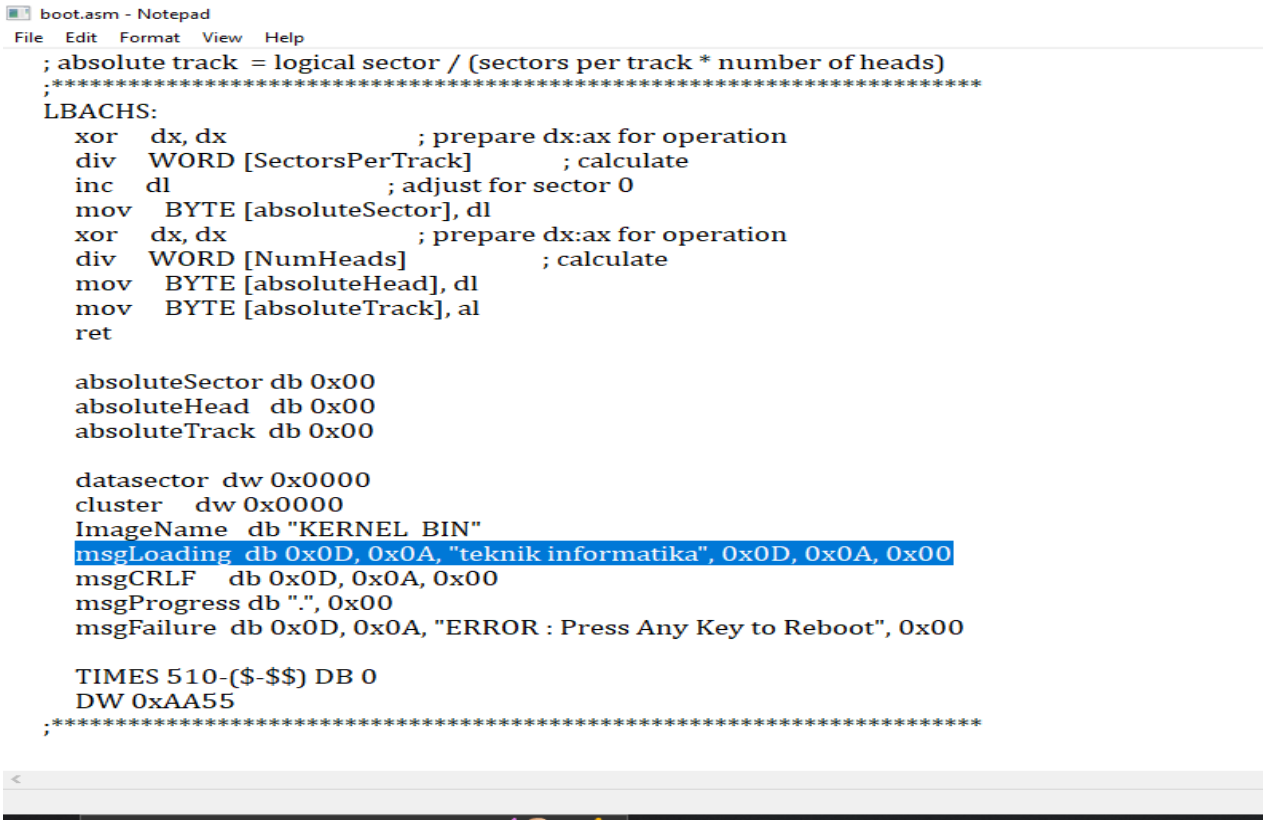


Cari teks “Loading Kernel”, kelompok baris bawah pada windows “notepad”

Untuk menemukan teks “Loading Kernel” tekan tombol “ CTRL + F ” dan masukan kata kunci “Loading Kernel”

Atau Scroll paling bawah sampai menemukan ‘ *msgoading db 0x0D, 0x0D, 0x0A, “teknik informatika”, 0x0A, 0x00* ‘

Pada file sebelumnya nama “Loading Kernel” sudah diganti menjadi “teknik informatika”



Lalu edit menjadi **msgoading db 0x0D, 0x0D, 0x0A, “Belajar membuat BOOTSTRAP-LOADER”, 0x0A, 0x00**

Dan juga edit menjadi ’ **msgFailure db 0x0D, 0x0A, "ERROR : Press Any Key to Reboot", 0x00** *‘*

boot.asm - Notepad

File Edit Format View Help

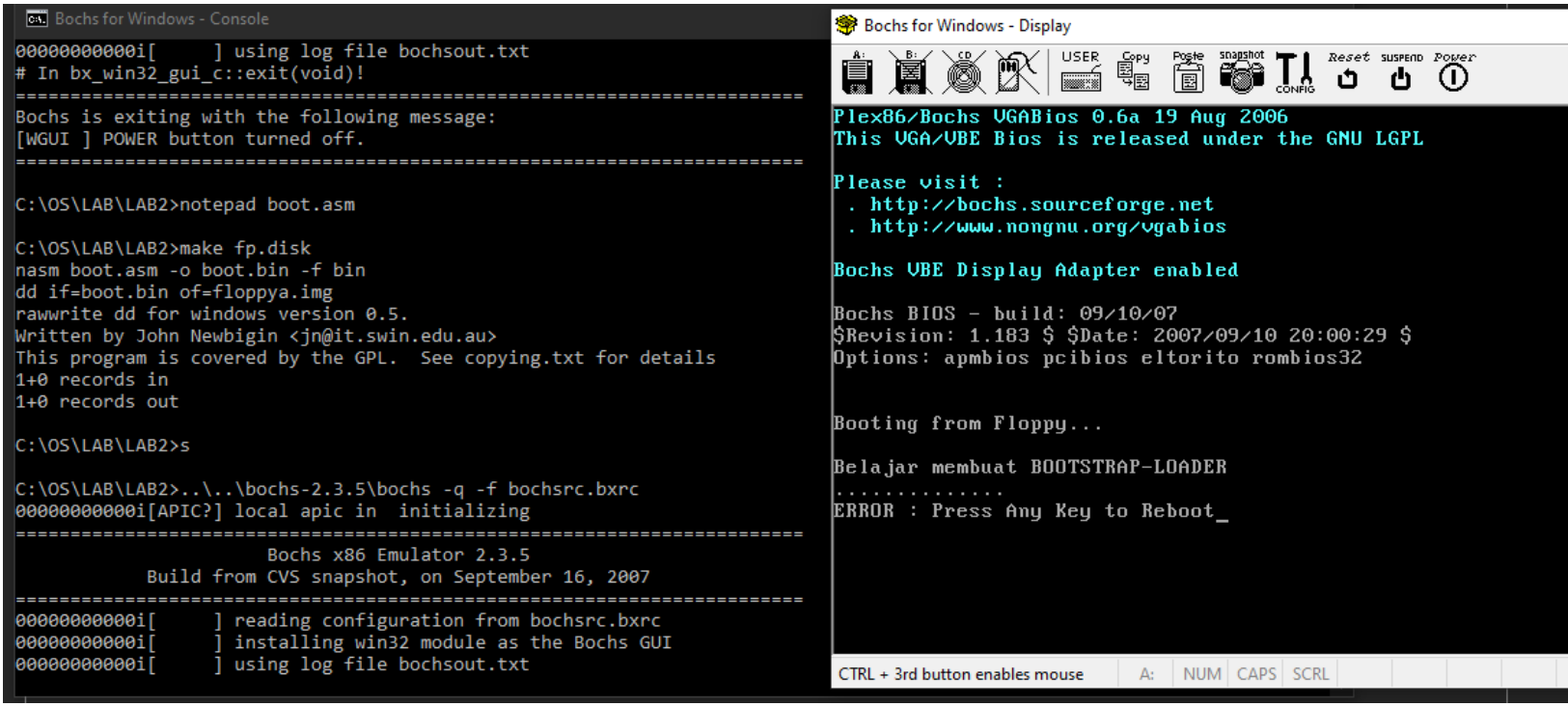
```
; absolute track  = logical sector / (sectors per track * number of heads)
;*****************************************************************************
LBACHS:
   xor    dx, dx                   ; prepare dx:ax for operation
   div    WORD [SectorsPerTrack]           ; calculate
   inc    dl                       ; adjust for sector 0
   mov    BYTE [absoluteSector], dl
   xor    dx, dx                   ; prepare dx:ax for operation
   div    WORD [NumHeads]                  ; calculate
   mov    BYTE [absoluteHead], dl
   mov    BYTE [absoluteTrack], al
   ret

   absoluteSector db 0x00
   absoluteHead   db 0x00
   absoluteTrack  db 0x00

   datasector  dw 0x0000
   cluster     dw 0x0000
   ImageName   db "KERNEL  BIN"
   msgLoading  db 0x0D, 0x0A, "Belajar membuat BOOTSTRAP-LOADER", 0x0D, 0x0A, 0x00
   msgCRLF     db 0x0D, 0x0A, 0x00
   msgProgress db ".", 0x00
   msgFailure  db 0x0D, 0x0A, "ERROR : Press Any Key to Reboot", 0x00

   TIMES 510-($-$$) DB 0
   DW 0xAA55
;*****************************************************************************
```

Lalu tekan tombol **“ CTRL + S ”** dan close notepad

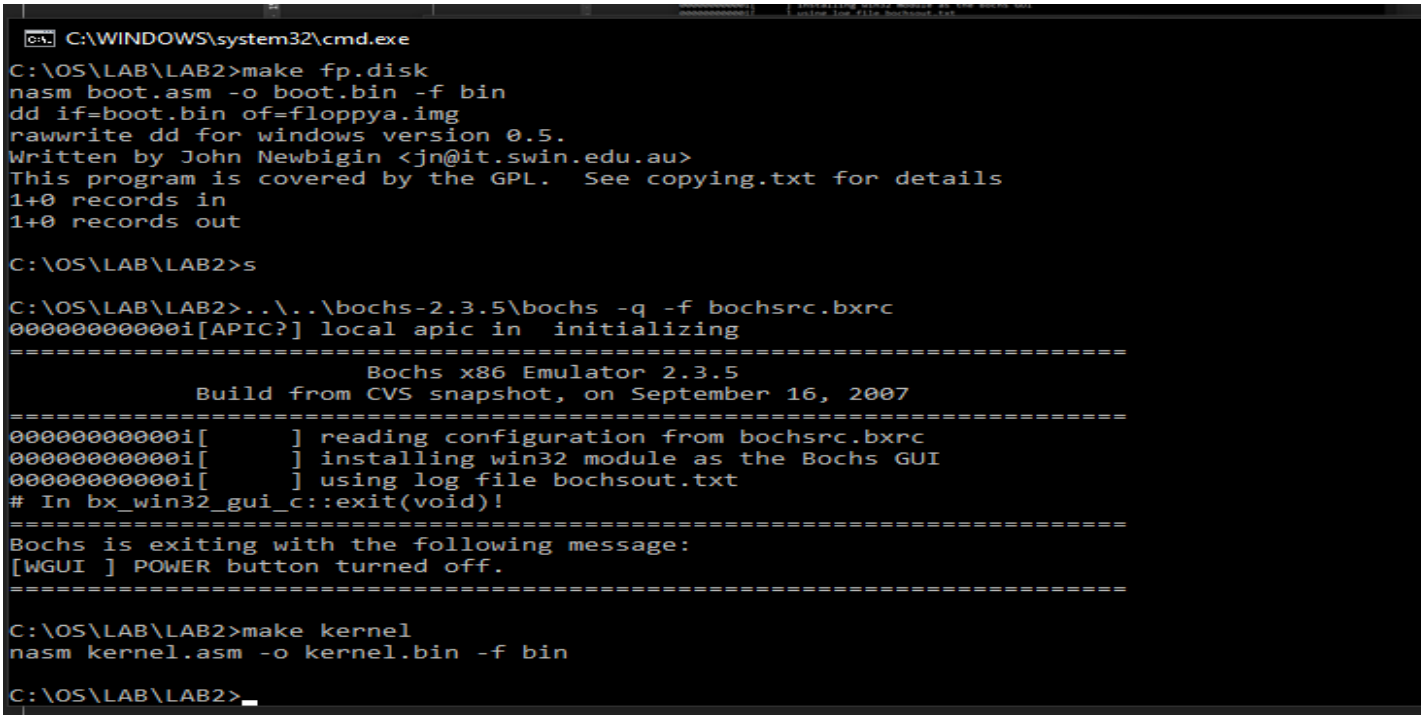
Lalu ketik **“ make fp.disk ”** dan **<ENTER>**

```
C:\WINDOWS\system32\cmd.exe

C:\OS\LAB\LAB2>s

C:\OS\LAB\LAB2>..\..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
00000000000i[APIC?] local apic in  initializing
========================================================================
                       Bochs x86 Emulator 2.3.5
            Build from CVS snapshot, on September 16, 2007
========================================================================
00000000000i[      ] reading configuration from bochsrc.bxrc
00000000000i[      ] installing win32 module as the Bochs GUI
00000000000i[      ] using log file bochsout.txt
# In bx_win32_gui_c::exit(void)!
========================================================================
Bochs is exiting with the following message:
[WGUI ] POWER button turned off.
========================================================================

C:\OS\LAB\LAB2>notepad boot.asm

C:\OS\LAB\LAB2>make fp.disk
nasm boot.asm -o boot.bin -f bin
dd if=boot.bin of=floppya.img
rawwrite dd for windows version 0.5.
Written by John Newbigin <jn@it.swin.edu.au>
This program is covered by the GPL.  See copying.txt for details
1+0 records in
1+0 records out

C:\OS\LAB\LAB2>
```

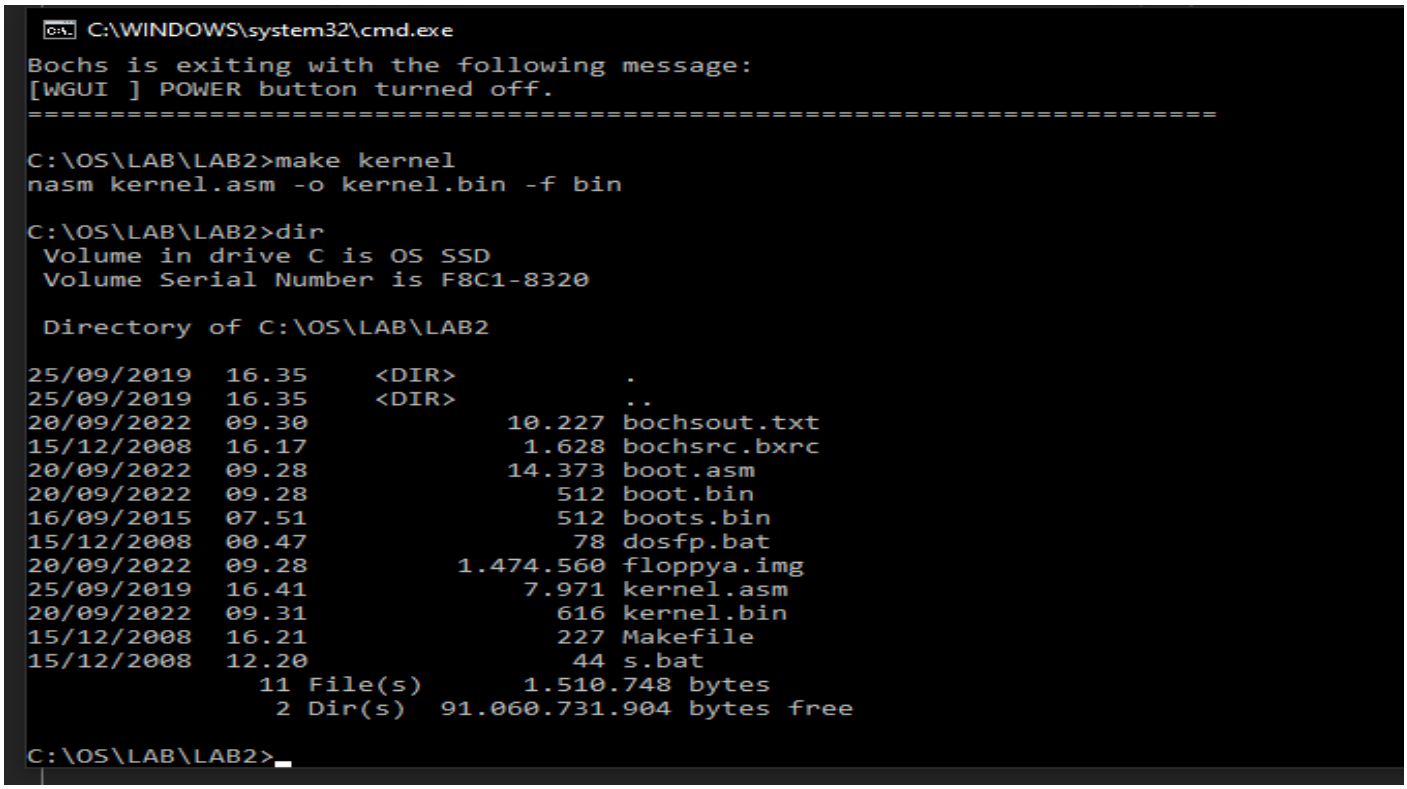
Jika proses kompilasi selesai, ketikan **“ s ”**. Jika teks sudah sama seperti yang dituliskan tadi pada notepad file ”boot.asm”, lalu klik tombol **“ Power ”**



Lalu ketik “ **make kernel** ”



Periksa file baru pada directory yaitu “kernel.bin” dengan mengetikan **“ dir ”**

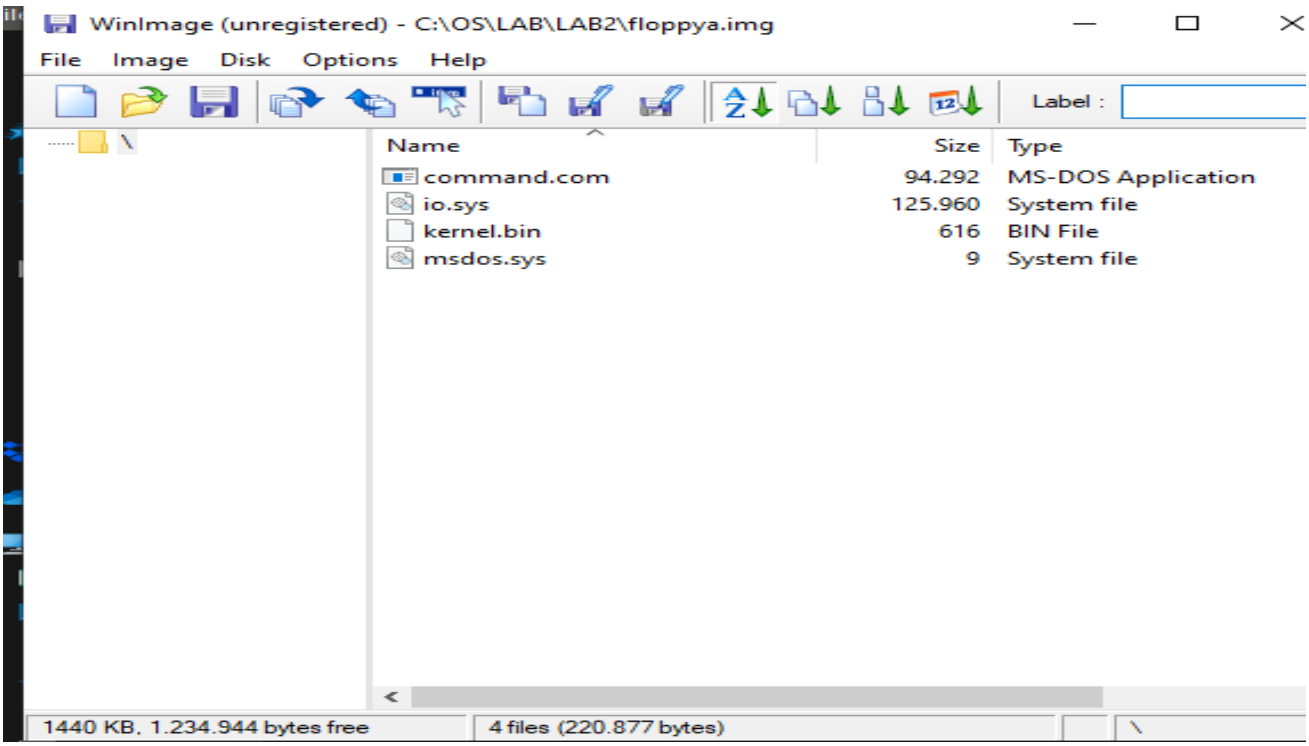


Memindahkan file “kernel.bin” ke dalam file image “floppya.img”.

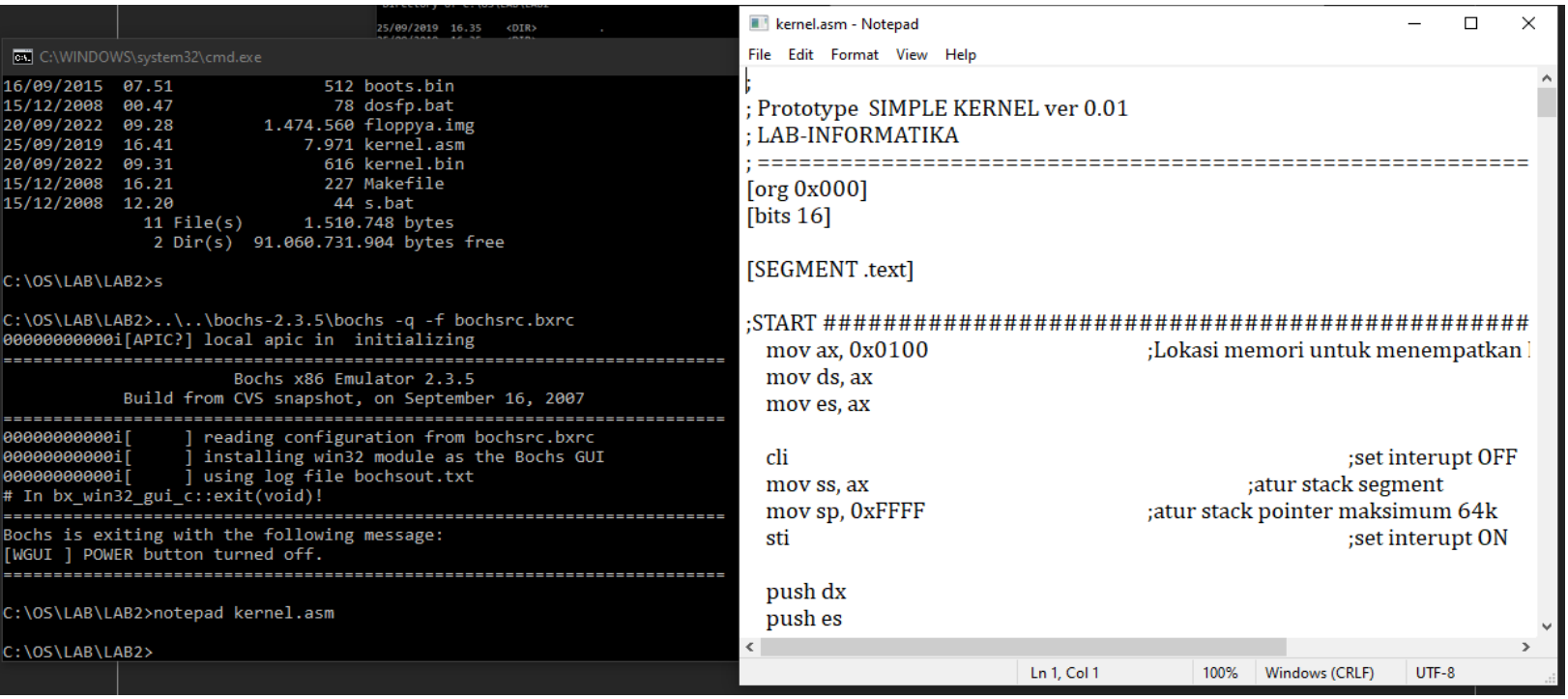
Buka **“Winimage “.**

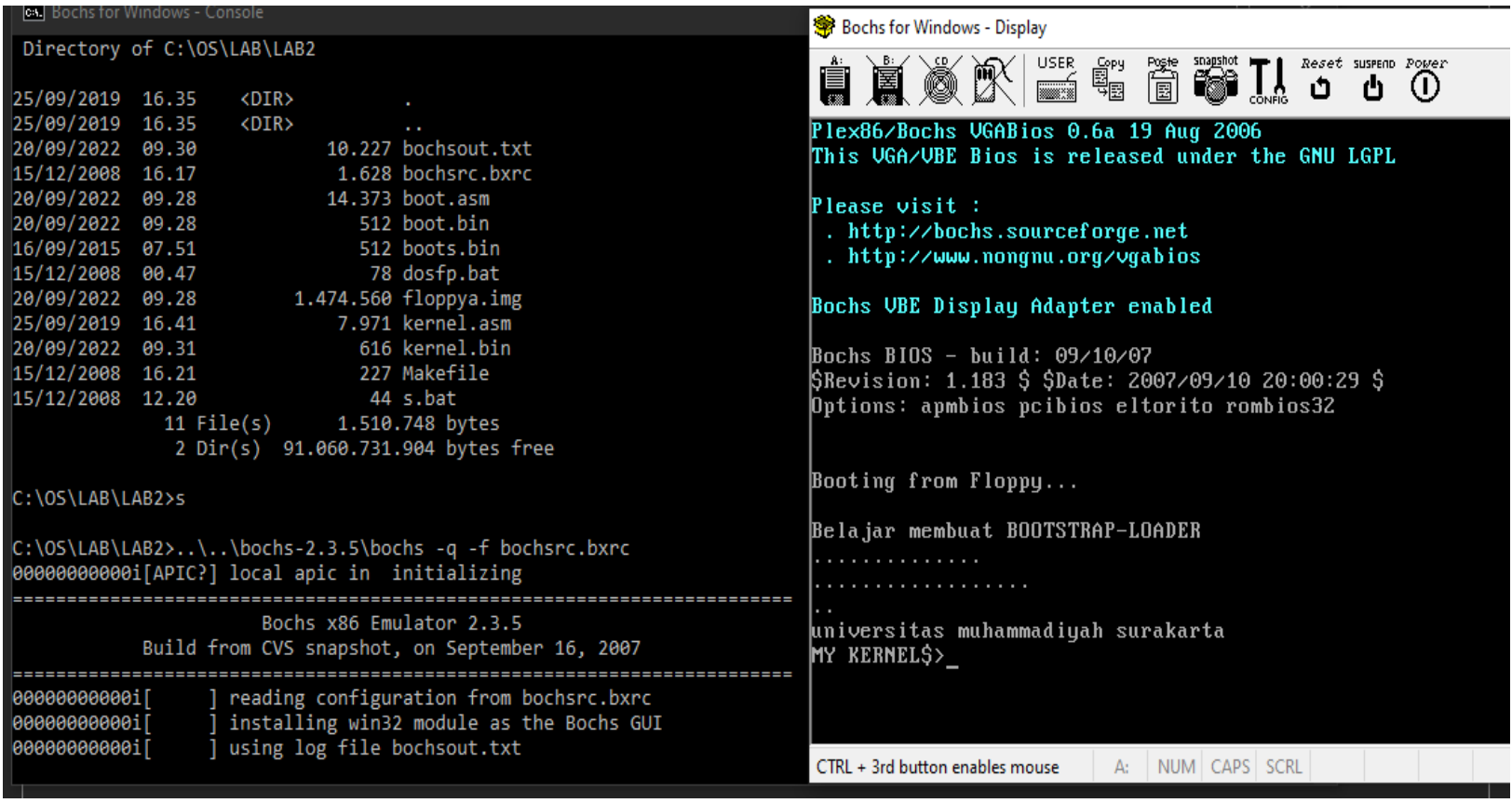
Buka directory kerja dan cari “ C:\OS\LAB\LAB2 ”, lalu klik “floppya.img”.

Klik menu **“ Image “**. Lalu **“ inject “.** Lalu cari nama file **“ kernel.bin ”**, klik **“ok”** dan Save. Dengan **“ CTRL + S ”** atau dengan klik menu “File” dan pilih save


WinImage (unregistered) - C:\OS\LAB\LAB2\floppya.img
File Image Disk Options Help
Label :
Name Size Type
command.com 94.292 MS-DOS Application
io.sys 125.960 System file
kernel.bin 616 BIN File
msdos.sys 9 System file
1440 KB, 1.234.944 bytes free
4 files (220.877 bytes)

Ketik **“ s ”**


C:\WINDOWS\system32\cmd.exe
16/09/2015 07.51 512 boots.bin
15/12/2008 00.47 78 dosfp.bat
20/09/2022 09.28 1.474.560 floppya.img
25/09/2019 16.41 7.971 kernel.asm
20/09/2022 09.31 616 kernel.bin
15/12/2008 16.21 227 Makefile
15/12/2008 12.20 44 s.bat
11 File(s) 1.510.748 bytes
2 Dir(s) 91.060.731.904 bytes free
C:\OS\LAB\LAB2>s
C:\OS\LAB\LAB2>..\..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
00000000000i[APIC?] local apic in initializing
Bochs x86 Emulator 2.3.5
Build from CVS snapshot, on September 16, 2007
00000000000i[ ] reading configuration from bochsrc.bxrc
00000000000i[ ] installing win32 module as the Bochs GUI
00000000000i[ ] using log file bochsout.txt
In bx_win32_gui_c::exit(void)!
Bochs is exiting with the following message:
[WGUI] POWER button turned off.
C:\OS\LAB\LAB2>notepad kernel.asm
C:\OS\LAB\LAB2>
kernel.asm - Notepad
File Edit Format View Help
; Prototype SIMPLE KERNEL ver 0.01
; LAB-INFORMATIKA
[org 0x000]
[bits 16]
[SEGMENT .text]
;START ##########
mov ax, 0x0100 ;Lokasi memori untuk menempatkan
mov ds, ax
mov es, ax
cli ;set interupt OFF
mov ss, ax ;atur stack segment
mov sp, 0xFFFF ;atur stack pointer maksimum 64k
sti ;set interupt ON
push dx
push es
Ln 1, Col 1 100% Windows (CRLF) UTF-8



Ketik **“ Notepad kernel.asm ”**

Cari teks “Welcome to My KERNEL”, kelompok baris bawah pada windows “notepad”

Untuk menemukan teks “Loading Kernel” tekan tombol “ CTRL + F ” dan masukan kata kunci “Welcome to My KERNEL”

Atau Scroll paling bawah sampai menemukan **strWelcomeMsg db "universitas muhammadiyah surakarta", 0x00 ‘**

Ubah menjadi ‘ **strWelcomeMsg db "Belajar Membuat KERNEL", 0x00** ‘

kernel.asm - Notepad

File Edit Format View Help

```
        mov al, 0x01
        int 0x21
        ret

[SEGMENT .data]
  strWelcomeMsg  db  "Belajar Membuat KERNEL", 0x00
        strPrompt                   db      "MY KERNEL$>", 0x00
        cmdMaxLen                   db      255                     ; maksimum COMMAND

        strOsName                   db      "MY KERNEL", 0x00       ;OS details
        strMajorVer                 db      "0", 0x00
        strMinorVer                 db      ".03", 0x00

        cmdVer                      db      "ver", 0x00             ; COMMADN internal
        cmdExit                     db      "exit", 0x00

        txtVersion                  db      "version", 0x00
        msgUnknownCmd  db           "COMMAND tidak dimengerti atau nama file salah!", 0x00

[SEGMENT .bss]
        strUserCmd      resb    256             ; buffer untuk menampung user commands
        cmdChrCnt       resb    1               ; hitungan jumlah karakter
        strCmd0         resb    256             ; buffers untuk menampung komponen COMMAND
        strCmd1         resb    256
        strCmd2         resb    256
        strCmd3         resb    256
        strCmd4         resb    256

;******************** akhir code MY KERNEL ********************
```

Ln 362, Col 48 100%

Ketik **“ make kernel ”**

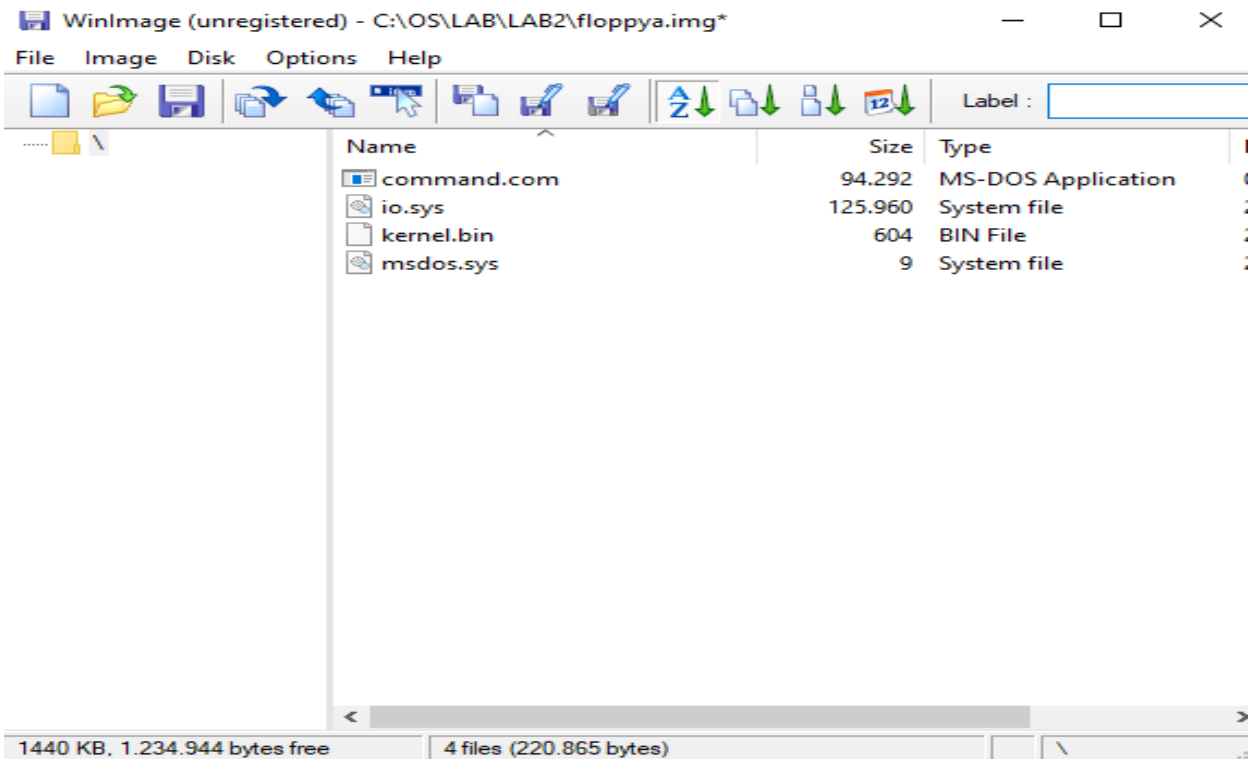
```
C:\WINDOWS\system32\cmd.exe
25/09/2019  16.41             7.971 kernel.asm
20/09/2022  09.31               616 kernel.bin
15/12/2008  16.21               227 Makefile
15/12/2008  12.20                44 s.bat
              11 File(s)      1.510.748 bytes
               2 Dir(s)  91.060.731.904 bytes free

C:\OS\LAB\LAB2>s

C:\OS\LAB\LAB2>..\..\bochs-2.3.5\bochs -q -f bochsrc.bxrc
00000000000i[APIC?] local apic in  initializing
========================================================================
                       Bochs x86 Emulator 2.3.5
            Build from CVS snapshot, on September 16, 2007
========================================================================
00000000000i[      ] reading configuration from bochsrc.bxrc
00000000000i[      ] installing win32 module as the Bochs GUI
00000000000i[      ] using log file bochsout.txt
# In bx_win32_gui_c::exit(void)!
========================================================================
Bochs is exiting with the following message:
[WGUI ] POWER button turned off.
========================================================================

C:\OS\LAB\LAB2>notepad kernel.asm

C:\OS\LAB\LAB2>make kernel
nasm kernel.asm -o kernel.bin -f bin

C:\OS\LAB\LAB2>
```

Memindahkan file “kernel.bin” ke dalam file image “floppya.img”.

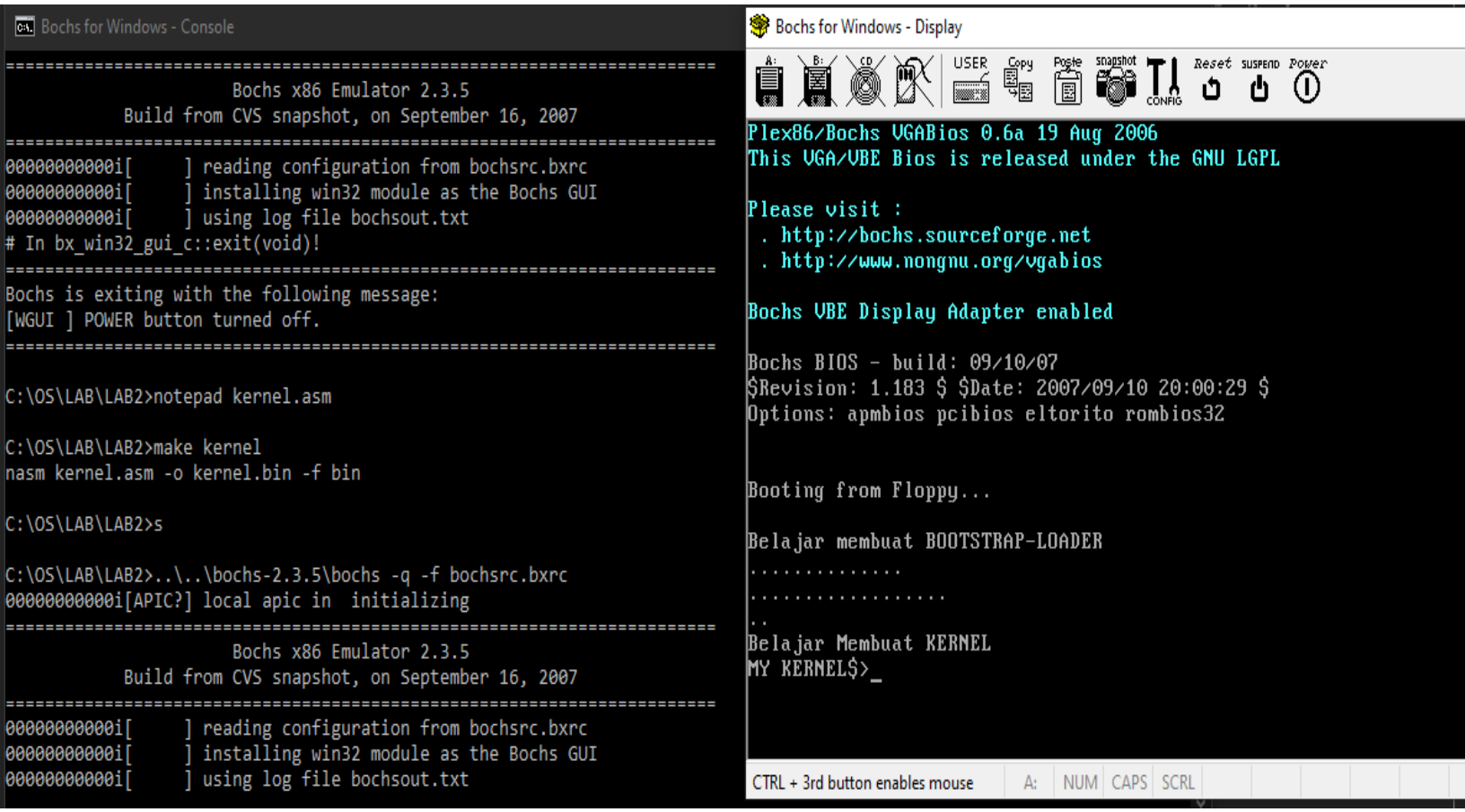
Buka **“Winimage “.**

Buka directory kerja dan cari “ C:\OS\LAB\LAB2 ”, lalu klik “floppya.img”.

Klik menu **“ Image “**. Lalu **“ inject “.** Lalu cari nama file **“ kernel.bin ”**, klik **“ok”** dan Save. Dengan **“ CTRL + S ”** atau dengan klik menu “File” dan pilih save



Jalan PC-Simulator dengan Ketikan **“ s ”.** Jika tidak terjadi error maka di “Bochs Windows” terdapat teks yang sama yang tadi sudah dituliskan.

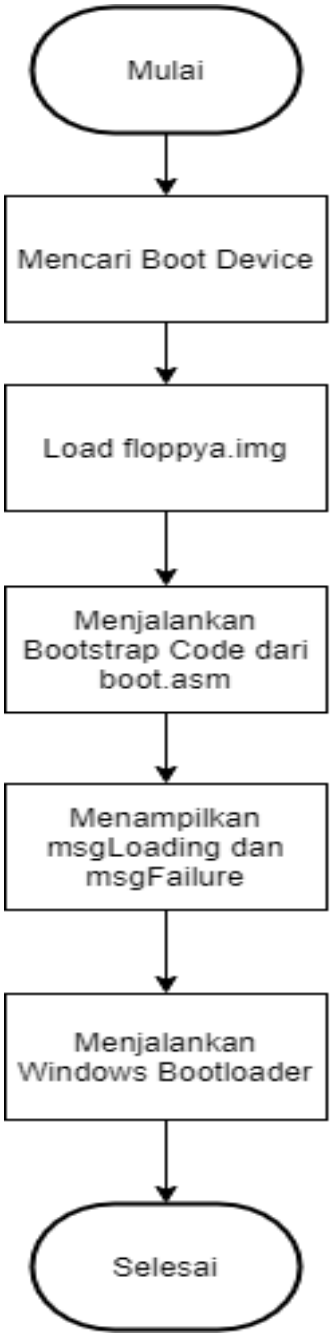


TUGAS

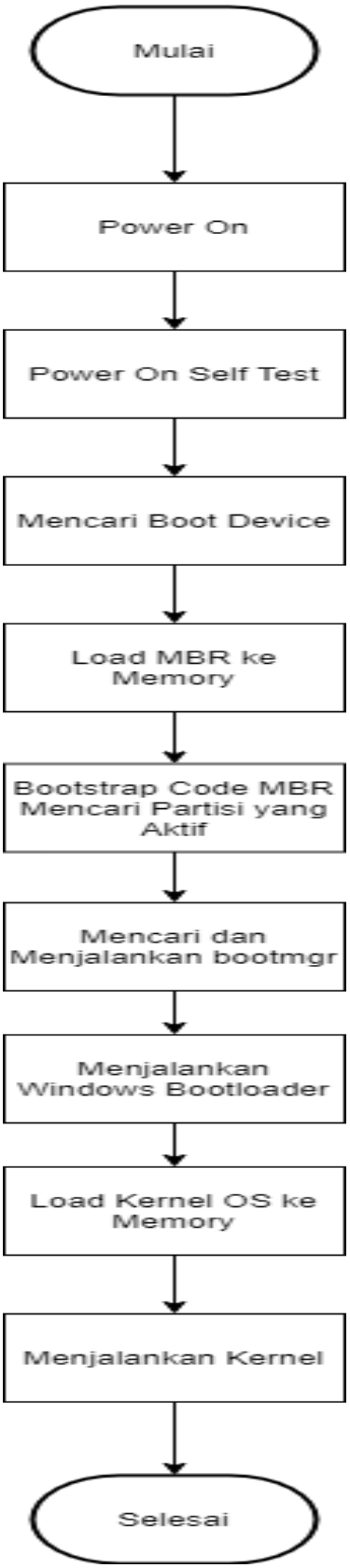
1. Buatlah algoritma dari program **“ boot.asm ”** dalam bentuk flowchart. *Buatlah dua jenis algoritma, pertama buat alogritma yang bersifat global dan kedua buat algoritma yang bersifat lebih detail*

Jawab :

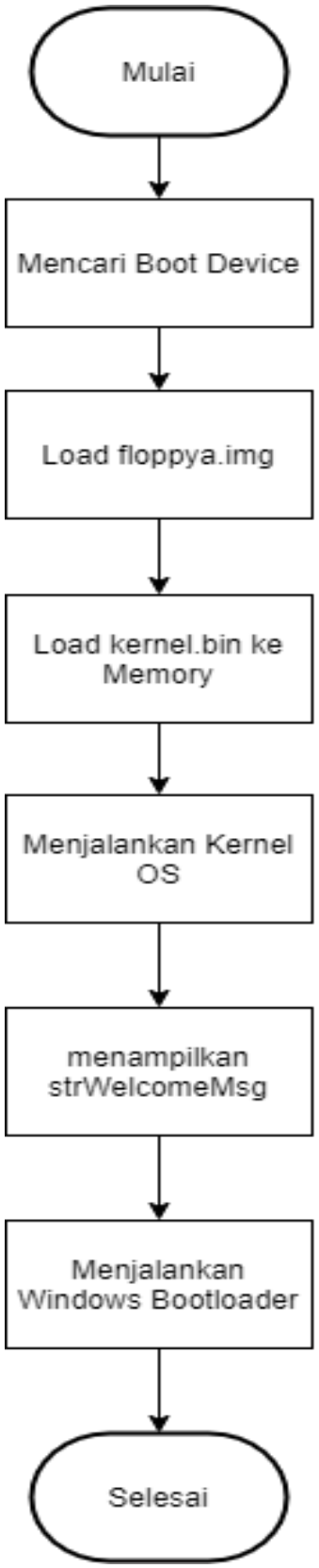
Flowchart alogritma yang bersifat ***global***



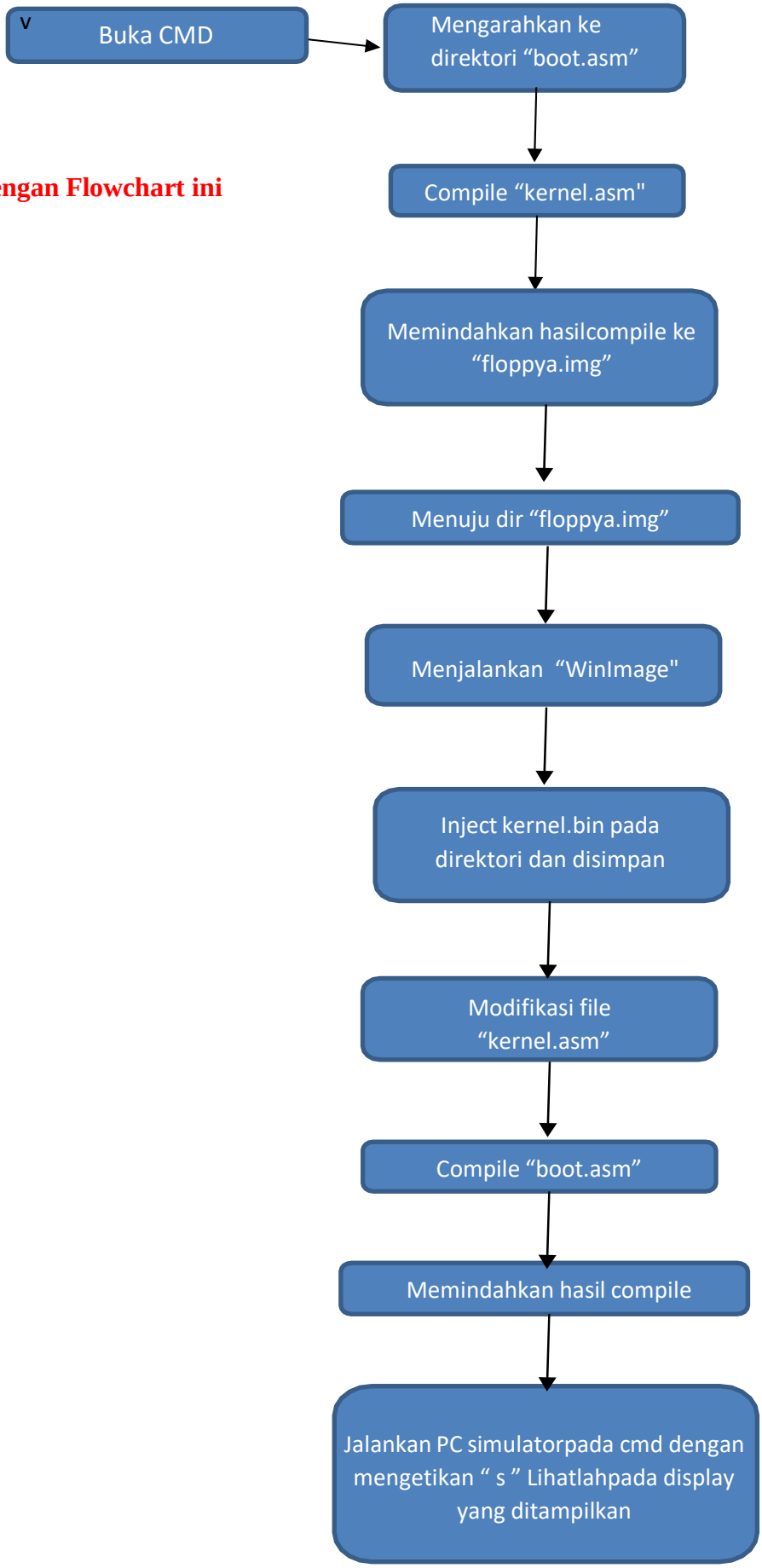
Flowchart algoritma yang bersifat ***lebih detail***



2. Buatlah algoritma dari program **“ kernel.asm ”** dalam bentuk flowchart.



Atau dengan Flowchart ini



ٱلْعَالَمِينَ رَبِّ لِلَّٰهِ ٱلْحَمْدُ